

CLAIMS

1) An emulsion (E) comprising a liquid or meltable hydrophobic phase (O) containing and/or consisting of at least one hydrophobic active material (A), said emulsion (E) being:

- in the form of a multiple emulsion (Em) comprising:
 - an inner inverse emulsion (Ei) comprising said continuous liquid or meltable hydrophobic phase (O), an aqueous dispersed phase (Wi) and, at the interface of the two phases, at least one water-soluble or water-dispersible stabilizer (Di)
 - an aqueous or water-miscible outer phase (We), in which is dispersed the inner emulsion (Ei), by means of at least one dispersant and/or stabilizer (De)
- or in a solid form (Es), which is water-dispersible as a multiple emulsion (Em) in which the outer phase (We) is aqueous, comprising
 - the inverse emulsion (Ei) dispersed in a water-soluble or water-dispersible solid matrix (M), and
 - the dispersant and/or stabilizer (De) located at the interface of the inverse emulsion (Ei) and of the matrix (M) and optionally dispersed in the matrix (M)

said emulsion being characterized in that the stabilizer (Di) at the interface of the two phases of the inner inverse emulsion (Ei) is made of a material chosen from water-soluble or water-dispersible polysaccharides (PSA):

- the mean degree of polymerization (DP) of which is at least 1.5, preferably at least 20 and most particularly at least 100,
- the Brookfield viscosity of which, at 25°C as a solution at 1% by mass in water, is less than 20 000 mPa.s and preferably less than 5000 mPa.s, most particularly ranging from 1 to 4500 mPa.s,

said polysaccharides (PSA) also being free of lipophilic polyorganosiloxane substituent groups.

2) The emulsion as claimed in claim 1), characterized in that the hydrophobic phase (O) is made of at least one organic or organosilicon material

or of a mixture of at least one organic material and of at least one organosilicon material, which is liquid or meltable and insoluble in an aqueous phase.

3) The emulsion as claimed in claim 1) or 2), characterized in that the active material (A) is made of at least one organic or organosilicon material, of a mixture of at least one organic material and of at least one organosilicon material, which is liquid or meltable and insoluble in an aqueous phase, of at least one solid or liquid inorganic material that is insoluble in an aqueous phase or of a mixture of at least one of said inorganic materials and of at least one of said organic materials and/or of at least one of said organosilicon materials.

4) The emulsion as claimed in any one of claims 1) to 3), characterized in that said hydrophobic phase (O) and/or said active material (A) is an oil, a wax or a resin made of a linear, cyclic, branched or crosslinked polyorganosiloxane.

5) The emulsion as claimed in claim 4), characterized in that said polyorganosiloxane is a nonionic or amino polyorganosiloxane.

6) The emulsion as claimed in any one of claims 1) to 3), characterized in that said hydrophobic phase (O) and/or said active material (A) is made of an organic material chosen from:

- C₁-C₃₀ carboxylic acid mono-, di- or triglycerides or mixtures thereof, especially plant oils
- technical oils, especially cooked, blown or standolized linseed oils
- sucroesters and sucroglycerides
- C₁-C₃₀ alcohol esters of C₁-C₃₀ carboxylic or C₂-C₃₀ dicarboxylic acids
- ethylene glycol or propylene glycol monoesters or diesters of C₁-C₃₀ carboxylic acids
- propylene glycol C₄-C₂₀ alkyl ethers
- di (C₈-C₃₀) alkyl ethers
- mineral oils, especially naphtha oils, liquid paraffins and polybutenes
- organic waxes comprising alkyl chains containing from 4 to 40 carbon atoms, especially animal waxes, plant waxes, mineral waxes, hydrocarbon-based waxes containing from 4 to 35 carbon atoms, and synthetic waxes.

7) The emulsion as claimed in any one of claims 1) to 3), characterized in that the active material (A) is contained in the hydrophobic phase (O) and is made of one or more fragrancings molecules, an organic or organosilicon UV stabilizer, a hydrophobic bactericidal agent, solid polyamide capsules, silica particles or particles of another inorganic oxide or compound.

8) The emulsion as claimed in any one of claims 1) to 7), characterized in that said polysaccharide (PSA) or its skeleton is a linear or branched, nonionic or ionic homopolysaccharide or heteropolysaccharide, comprising identical or different glycosyl units linked via $\beta(1-4)$ bonds, and possibly other bonds, especially $\beta(1-3)$ and/or $\beta(1-6)$ bonds.

9) The emulsion as claimed in claim 8), characterized in that the hydroxyl functions of the glycosyl units are substituted and/or modified with nonionic or ionic groups other than lipophilic polyorganosiloxane groups.

10) The emulsion as claimed in claim 8) or 9), characterized in that said polysaccharide (PSA) is chosen from:

- depolymerized galactomannans, preferably guar gum, optionally modified or substituted with nonionic groups, preferably hydroxypropyl, anionic groups, preferably carboxymethyl, or cationic groups, preferably hydroxypropyltrimethylammonium chloride;
- cellulose monoacetates with a degree of substitution of from 0.3 to less than 1.2 and preferably from 0.3 to 1,
- hydroxypropylcelluloses with a degree of modification of about from 0.2 to 1.5
- carboxymethylcelluloses with a degree of substitution of from 0.05 to 1.2 and preferably from 0.05 to 1
- dextrans optionally containing hydroxyethyl, hydroxypropyl or quaternized aminoalkyl groups
- xyloglycans, for instance tamarind gum
- arabinoxylans
- alkylpolyglycosides.

11) The emulsion as claimed in any one of claims 1) to 10), characterized in that the mass ratio of the dispersed aqueous phase (Wi) to the hydrophobic phase (O) ranges from 5/95 to 95/5 and preferably from 30/70 to 80/20.

5 12) The emulsion as claimed in any one of claims 1) to 11), characterized in that the ratio of the mass of stabilizer (Di) to the mass of hydrophobic phase (O) ranges from 0.1/100 to 500/100, preferably from 0.5/100 to 100/100 and most particularly from 0.5/100 to 50/100.

10 13) The emulsion as claimed in any one of claims 1) to 12), characterized in that said dispersant and/or stabilizer (De) is chosen from hydrophilic surfactants and/or hydrophilic polymers and/or hydrophilic amphiphilic polymers.

15 14) The emulsion as claimed in claim 13), characterized in that said dispersant and/or stabilizer (De) is formed from

- (a) at least one nonionic hydrophilic surfactant
- (b) at least one anionic hydrophilic surfactant
- (c) at least one cationic hydrophilic surfactant
- (d) at least one nonionic hydrophilic polymer
- 20 (e) at least one nonionic hydrophilic amphiphilic polymer
- (f) at least one anionic hydrophilic polymer
- (g) at least one anionic hydrophilic amphiphilic polymer
- (h) at least one cationic hydrophilic polymer
- (i) at least one cationic hydrophilic amphiphilic polymer
- 25 (j) or a mixture of at least two of said surfactants and/or polymers (a) to (d) above, which are compatible.

15) The emulsion as claimed in claim 13) or 14), characterized in that the total content of surfactant(s) and/or polymer(s) (De) present in the outer phase
30 (We) is between 0.01% and 50% by weight, preferably between 0.1% and 10% and more particularly between 0.5% and 5% by weight relative to the inverse emulsion (Ei).

16) The emulsion as claimed in any one of claims 13) to 15), characterized in that said hydrophilic polymer (De) is made of or comprises at least one water-soluble or water-dispersible polysaccharide (PSA) (Di).

5 17) The emulsion as claimed in any one of claims 1) to 16), characterized in that the mass ratio of inner inverse emulsion (Ei)/outer phase (We) comprising the dispersant and/or stabilizer (De) ranges from 50/50 to 99/1, preferably from 70/30 to 98/2 and most particularly from 70/30 to 80/20.

10 18) The emulsion as claimed in any one of claims 1) to 17), characterized in that the mass ratio, expressed as solids, of dispersant and/or stabilizer (De)/mass of the inner inverse emulsion (Ei) ranges from 0.01/100 to 50/100, preferably from 0.1/100 to 10/100 and most particularly from 0.5/100 to 5/100.

15 19) The emulsion as claimed in any one of claims 1) to 18), characterized in that the concentration of dispersant and/or stabilizer (De) in the outer phase (We) ranges from 1% to 50%.

20 20) The emulsion as claimed in any one of claims 1 to 19, characterized in that the outer phase (We) is an aqueous phase.

25 21) The emulsion as claimed in any one of claims 1) to 19), characterized in that the outer phase (We) is an alcoholic or aqueous-alcoholic phase, preferably isopropanol or ethanol.

30 22) The emulsion as claimed in any one of claims 1) to 20), characterized in that the active material (A) contained in or constituting the hydrophobic phase (O) is chosen from care or detergence agents for articles made of textile fibers, and in that the outer phase (We) is an aqueous liquid detergent formulation containing the dispersant and/or stabilizer (De) formed from a mixture of at least one nonionic hydrophilic surfactant and of at least one anionic hydrophilic surfactant, optionally combined with at least one nonionic hydrophilic (amphiphilic) polymer.

35 23) The emulsion as claimed in any one of claims 1) to 19) and 21), characterized in that the active material (A) contained in or constituting the

hydrophobic phase (O) is chosen from care or detergence agents for articles made of textile fibers, and in that the outer phase (We) is a water-miscible nonaqueous liquid detergent formulation, containing the dispersant and/or stabilizer (De) formed from a mixture of at least one nonionic hydrophilic surfactant and of at least one anionic hydrophilic surfactant, optionally combined with at least one nonionic hydrophilic (amphiphilic) polymer.

24) The emulsion as claimed in any one of claims 1) to 20), characterized in that the active material (A) contained in or constituting the hydrophobic phase (O) is chosen from care agents for articles made of textile fibers, and in that the outer phase (We) is an aqueous liquid rinsing formulation, containing the dispersant and/or stabilizer (De) formed from at least one cationic hydrophilic surfactant and/or from at least one cationic hydrophilic (amphiphilic) polymer, optionally mixed with at least one nonionic hydrophilic surfactant and/or at least one nonionic hydrophilic (amphiphilic) polymer.

25) The emulsion as claimed in any one of claims 1) to 20), characterized in that the active material (A) contained in or constituting the hydrophobic phase (O) is chosen from agents in the field of paints, and in that the outer phase (We) is a water-based paint.

26) The emulsion as claimed in any one of claims 1) to 20), characterized in that the active material (A) contained in or constituting the hydrophobic phase (O) is chosen from agents in the field of cosmetics or body care, and in that the outer phase (We) is an aqueous cosmetic composition.

27) The emulsion as claimed in any one of claims 1) to 16), characterized in that it is in (Es) form and in that the solid matrix (M) is made of a material chosen from:

- polyethylene glycols with a molecular mass of between 2000 and 100 000 g/mol
- copolymers of ethylenically unsaturated carboxylic acid or anhydride and of ethylenically unsaturated nonionic monomer
- water-soluble or water-dispersible polypeptides of natural or synthetic origin

- polyelectrolytes in acid form, belonging to the family of weak polyacids, with a molecular mass of less than 20 000 g/mol, preferably between 1000 and 5000 g/mol
- polyvinylpyrrolidones with a molecular mass of less than 20 000 g/mol and preferably from 1000 to 10 000 g/mol
- polyvinyl alcohols with a molecular mass of less than 100 000 g/mol, preferably having a degree of deacetylation of from 80 mol% to 99 mol%
- water-soluble or water-dispersible film-forming ampholytic polymers
- water-soluble or water-dispersible saccharides, osides or polyholosides
- water-soluble or water-dispersible amino acids or amino acid salts
- citric acid
- fatty acids
- urea
- surfactants of which the water-surfactant binary phase diagram comprises an isotropic phase that is fluid at 25°C up to a concentration of at least 50% by weight of surfactant, followed by a rigid liquid crystal phase of hexagonal or cubic type at higher concentrations, which is stable at least up to 60°C
- water-soluble or water-dispersible alkali metal salts, for instance alkali metal silicates, carbonates, phosphates, sulfates, phosphonates, acetates or citrates, or alkali metal salts of saturated or unsaturated fatty acids, and mixtures of sodium acetate and of citric acid
- or mixtures thereof.

28) The use of the emulsion (E) forming the subject of any one of claims 1) to 27), for conveying, in aqueous medium (B) in contact with a substrate (S), the hydrophobic phase (O) containing and/or consisting of at least one hydrophobic active material (A), to said substrate (S).

29) The use as claimed in claim 28), characterized in that said substrate (S) is made of any material, especially of a metal or any natural, artificial or synthetic material, or of a mixture of these materials.

30) The use as claimed in claim 28) or 29), in paints, for conveying a water-repellent agent onto a surface made of a building material, plaster, cement or

wood, with release of the water-repellent agent by deposition and drying of the paint on the surface.

5 31) The use as claimed in claim 28) or 29), in cosmetic compositions, for conveying a cosmetic or bodycare or haircare hydrophobic active material, with release of the hydrophobic agent by deposition or application and drying on the skin or the hair.

10 32) The use as claimed in claim 28) or 29), in formulations for treating metals.

15 33) The use as claimed in claim 28) or 29), for the preparation or post-treatment of a surface made of a woven or nonwoven material of cellulose and/or synthetic origin, for body hygiene or household cleansing, intended to come into contact with the skin.

34) The use as claimed in claim 28) or 29), for the preparation or post-treatment of cardboard or cardboard packaging.

20 35) The use as claimed in claim 28) or 29), for conveying, in an aqueous medium (B) placed in contact with a substrate (S), the hydrophobic phase (O) containing and/or consisting of at least one hydrophobic active material (A), to said substrate (S), the volume of said aqueous medium being sufficient to cause the destabilization and/or breaking of the emulsion (E) by dilution of said emulsion
25 (E) and/or drying subsequent to the dilution of said emulsion (E), and the provision and/or release of the active material (A) contained in or constituting the hydrophobic phase (O), on the substrate (S).

30 36) The use as claimed in claim 35), characterized in that the multiple emulsion (Em) comprises at least 70% by weight of inner emulsion (Ei).

35 37) The use as claimed in claim 35) or 36), characterized in that the relative amounts of emulsion (Em) and of aqueous medium (B) are equivalent to a 2-fold to 100-fold dilution of the volume of said emulsion (Em).

38) The use as claimed in any one of claims 35) to 37), for conveying and depositing a hydrophobic active material on a hydroxyapatite surface, a keratinous surface or a textile surface.

5 39) The use as claimed in claim 38), in a formulation for dental or oral hygiene, intended to be rinsed out or diluted.

40) The use as claimed in claim 38), in a cosmetic formulation for haircare and/or skincare, intended to be rinsed off or diluted.

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41) The use as claimed in any one of claims 35) to 38), characterized in that the hydrophobic phase (O) and/or the active material (A) is chosen from care or detergence agents for articles made of textile fibers.

15 42) The use of the emulsion (E) as claimed in claim 38) or 41), as an additive in a detergent composition for washing or rinsing articles made of textile fibers, or as a detergent or rinsing composition for washing or rinsing articles made of textile fibers, with the aim of conveying a hydrophobic care agent and/or any other hydrophobic active material, and of promoting the deposition of said agent or material onto an article made of textile fibers, especially cotton, during
20 the rinsing operation and/or during the drying operation subsequent to the main washing operation when it is a detergent washing composition, or during the subsequent drying operation when it is a rinsing composition.

25 43) A process for conveying, to a substrate (S) in contact with an aqueous medium (B), at least one active material (A) contained in or constituting a liquid or meltable hydrophobic phase (O) of the emulsion (E) forming the subject of any one of claims 1) to 27), by placing said emulsion (E) with the substrate (S) in contact with the aqueous medium (B).

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44) The process as claimed in claim 43), characterized in that the volume of said aqueous medium (B) is sufficient to cause the destabilization and/or breaking of the emulsion (E) by dilution of said emulsion (E) and/or drying subsequent to the dilution of said emulsion (E), and the provision and/or release of the active

material (A) contained in or constituting the hydrophobic phase (O), on the substrate (S).

- 45) The process as claimed in claim 44), characterized in that the emulsion
5 (E) is a multiple emulsion (Em) comprising at least 70% by weight of inner emulsion (Ei).